

**Comment on the proposed conservation of the specific and subspecific names of *Trigonocephalus pulcher* Peters, 1863 [recte 1862] and *Bothrops albocarinatus* Shreve, 1934 (Reptilia, Serpentes) by the designation of a neotype for *T. pulcher* (Case 2921; see BZN 54: 35–38)**

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I am writing to ask the Commission not to take the action proposed by Schätti & Smith. There are gaps in the literature cited by the proposers, and they do not mention publications which are crucial in understanding the case.

In the following I present evidence that the specific name *almawebi* Schätti & Kramer, 1993 (see para. 4 of the application) is a junior subjective synonym of *campbelli* Freire, 1991, that the latter is the valid name for the western, terrestrial pitviper concerned in this case, and that there is no 'universal usage' (para. 6 of the application) of the specific name *pulcher* Peters, 1862 (not 1863 as stated in the application: see Bauer et al., 1995).

Freire (1991) described two new pitviper species. A terrestrial pitviper from near Huagal, Cantón Pallatanga, Province of Chimborazo, Ecuador, was described as *Bothrops campbelli*, and a (presumably arboreal) pitviper from the same locality was named *B. osbornei*. The male holotype of *B. campbelli* Freire, 1991 is deposited in the herpetological collection of the Instituto Nacional de Higiene y Medicina Tropical 'Leopoldo Izquieta Pérez' in Guayaquil, Ecuador (catalogue no. INHMT 1956). Photographs of the holotype and a topotype were published by Campbell & Lamar (1992, p. 12). Colour slides of the holotype and topotypes are kept in the slide collections of the University of Texas (Arlington Collection of Vertebrates, catalogue nos. 15543, 15544–45), the herpetological slide collection of the Senckenberg Museum, and my private slide collection. A detailed redescription of the holotype and five topotypes of *B. campbelli*, as well as the holotype of *Trigonocephalus pulcher* Peters, 1862, is in preparation (U. Kuch, unpublished manuscript).

Doubts as to the validity, and availability, of the name *Bothrops campbelli* Freire, 1991 arose soon after its publication (J.A. Campbell, in lit. 30 November 1991), and the name was subsequently considered a junior subjective synonym of a redefined *B. pulcher* by Campbell & Lamar (1992), to whom the holotype of *Trigonocephalus pulcher* Peters, 1862 had not been available. Campbell & Lamar (1992) also indicated that the legitimacy of Freire's (1991) publication could be challenged under Articles 8d and 9(3) of the Code, which require 'conventional printing' and outlaw 'photocopies as such'.

Schätti & Kramer (1993) discovered that the holotype of *T. pulcher* actually represented an arboreal pitviper of Amazonian Ecuador; they rejected the availability of Freire's publication and gave the new name *Porthidium almawebi* to the western species (see also Wüster et al., 1997 for a review of the nomenclatural history of *Bothrops campbelli*). They did not however present any evidence in favour of the rejection of Freire's paper.

Freire's (1991) description of two new snake taxa was issued publicly: it was obtainable free of charge from the publisher (Universidad Técnica de Machala,

Ecuador) or from the author. Schätti & Kramer (1993) suggested that Freire's work was a barely readable photocopy. However, an expert opinion (E. Schulz, in lit. 6 October 1996) confirms that the publication was produced by a conventional printing technique, probably offset printing; photocopies of the evaluation and of Freire (1991) are held by the Commission Secretariat. The work is to be regarded as published within the meaning of the Code, and the two names *Bothrops campbelli* Freire, 1991 and *B. osbornei* Freire, 1991 are available. In any event, for unknown reasons the descriptions of *B. campbelli* and *B. osbornei* were republished in a serial a year later (Freire, 1992).

Schätti & Kramer (1993) suggested that the Amazonian taxon was conspecific with a pitviper from Peru and Bolivia, presently known as *Bothriopsis* [*Bothrops* s. lat.] *oligolepis* (Werner, 1901). However, their conclusion was not based on a thorough analysis of geographical and non-geographical variation in these widely distributed snakes, or at least no such analysis was mentioned. Although the notion that these pitvipers are conspecific cannot at present be refuted, given their rarity in museum collections, it remains questionable whether many herpetologists will follow the taxonomic opinion of Schätti & Kramer (1993); see also Wüster et al. (1997). The hypothetical problem of a name change of *oligolepis* to *pulcher oligolepis* (para. 5 of the application) has no value as an argument in favour of the application by Schätti & Smith.

Schätti & Smith (para. 1) state that 'Subsequent authors have all followed Boulenger's (1896) usage and applied the specific name *pulcher* ... to a terrestrial species of pitviper found along the Pacific slopes of the Andes' and (para. 5) that '*pulcher* has never been used for the Amazonian species for which [W.] Peters (1863) proposed it.' This statement is incorrect. In fact, the usage of *pulcher* was until recently dubious, and inconsistent with known distributional patterns of Andean pitvipers. Two important points should be considered in this context, as follows.

First, the name *pulcher* has been used correctly for Amazonian pitvipers in the literature. Such important and widely used works as J.A. Peters (1960, p. 510), Klemmer (1963, p. 412), U.S. Navy Department Office of Naval Intelligence (1968, p. 61) and J.A. Peters & Orejas-Miranda (1970, p. 54) give the Amazonian lowlands in Ecuador and Peru as the range of *Bothrops pulcher*, thereby excluding the western species. Other, no less important, works give 'equatorial forests of Ecuador and Peru' as the geographical distribution of *B. pulcher* (Hoge, 1966, p. 132; Hoge & Romano, 1971, p. 257; Hoge & Romano Hoge, 1981, p. 218). 'Equatorial forests of Ecuador and Peru' (rather than Amazonian forests) might reflect some uncertainty of the latter authors as to the actual range limits of *B. pulcher*, because large parts of the two countries on both sides of the Andes are covered by forest. However, suitable habitat for the western species is unlikely to exist in Peru west of the Andes, except maybe in relictual forests near the Ecuadorian border, and indeed the species has not been found in Peru (Carrillo de Espinoza, 1983; Carrillo de Espinoza & Icochea, 1995). Therefore, the above statements implicitly refer to Amazonian pitvipers. Original publications about these snakes are scarce, and none of the cited works includes a description of *B. pulcher*. However, in the absence of evidence to the contrary, and taking into account the citation of the original description (W. Peters, 1862) in these widespread and frequently used publications, I assume that the Amazonian species was correctly referred to as *Bothrops pulcher* whenever the geographical

distribution of the latter was stated to comprise the Amazonian lowlands of Ecuador and Peru.

Notable exceptions are J.A. Peters (1960) and J.A. Peters & Orejas-Miranda (1970). The original description of *Bothrops pulcher* is cited in these works (J.A. Peters even included the catalogue number of the *B. pulcher* holotype), while Boulenger (1896) is not, and an Amazonian distribution is indicated. However, the characters used for the identification of *pulcher* in both the key to the *Bothrops* species of Ecuador (Peters, 1960, pp. 508–509) and the *Bothrops* data matrix in Peters & Orejas-Miranda (1970, pp. 39–42) apply to the western species rather than to the Amazonian one. Thus, it remains uncertain whether J.A. Peters erroneously included data from western specimens when he prepared the account of the Amazonian species *pulcher*, or if he referred to the western species as *Bothrops pulcher*, and the stated Amazonian distribution was in error.

Secondly, Schätti & Smith state (para. 5) that 'the junior name *albocarinatus* [of Shreve, 1934] has been consistently applied to the [Amazonian] taxon since 1934.' This statement is in itself correct, but at least two other specific names have also been used during this period: *pulcher* (see above) and *alticolus* Parker, 1934. Since 1934 the names *albocarinatus* and *alticolus* have coexisted in the literature, mostly under *Bothrops* and *Bothriopsis*. In an unpublished Ph.D. thesis, Burger (1971) was the first to treat *alticolus* as a synonym of *albocarinatus*, which has a few months priority. Campbell & Lamar (1989, pp. 170–172) strongly suspected that the two names referred to a single species, and this view was confirmed by Schätti et al. (1990).

Schätti & Smith suggest (para. 6) that there is a 'universal usage' of *pulcher* and *albocarinatus*, but this is not the case. In fact, the Amazonian species represented by the holotype of *Trionocephalus pulcher* Peters, 1862 is listed under all three names (*Bothrops albocarinatus*, *B. alticolus*, *B. pulcher*) in most of the major works on venomous snakes or influential regional checklists (e.g., Peters, 1960; Klemmer, 1963; Hoge, 1966; U.S. Navy Department Office of Naval Intelligence, 1968; Peters & Orejas-Miranda, 1970; Hoge & Romano, 1971; Hoge & Romano Hoge, 1981), and this 'triple nomenclature' was maintained in medical literature (Russell, 1979). Only in recent years has the use of *pulcher* been restricted to the western species; the first authors to do so explicitly were Campbell & Lamar (1989, 1992).

A list of 46 publications by 48 authors from 1862 to 1997 (based on the Systematic Index of Zoological Record and additional sources) that include any of the relevant names of this case (*pulcher*, *albocarinatus*, *alticolus*, *campbelli*, *almawebi*) is held by the Commission Secretariat. I have attempted to identify the species or the geographic origin of the snakes in these publications wherever possible, and come to the following conclusions. The name *pulcher* (under *Trionocephalus*, *Lachesis*, *Bothrops*) was used for the Amazonian species in 5 cases, for the western species in 7 cases, for both species in 6 cases (undetermined: 15 publications). The name *albocarinatus* (under *Bothriechis*, *Bothriopsis*, *Bothrops*) was used for the Amazonian species in 23 cases (undetermined: 7). The name *alticolus* (under *Bothriechis*, *Bothriopsis*, *Bothrops*) was used for the Amazonian species in 17 cases (undetermined: 8). The name *campbelli* (under *Bothrops*) was used for the western species in 5 cases. The name *almawebi* (under *Porthidium*) was used for the western species in 3 cases (undetermined: 1).



In many of these publications, only the stated geographical distribution allowed a decision as to whether a particular name was used for the western or for the Amazonian species. The possibility that authors might have referred to the western species while indicating an erroneous (Amazonian) distribution can therefore not be refuted. However, in the absence of evidence to the contrary, I regard the information contained in these works as correct and assume that the Amazonian species was actually referred to whenever an Amazonian distribution was given.

In much of the biomedical literature there is a serious problem in the identification of snakes and venoms; this is coupled with a lack of 'taxonomic awareness' among many biomedical researchers (see Wüster & McCarthy, 1996). Therefore, high priority should be given to the stability of the names of medically important species, so long as this is compatible with systematic and nomenclatural principles. Nevertheless, I feel that Schätti & Smith's remark 'stability is particularly important in the case of poisonous snakes' (para. 6) is too generalized a statement, because only a minority of venomous snakes is of toxinological or medical, let alone epidemiological, importance. The fact alone that a snake is venomous does not automatically call for a suspension of the strict application of the Code.

I have no knowledge of a single documented case of envenomation caused by either the western or the Amazonian species, and nothing is known of their venoms. Both species are secretive and rarely encountered in the field; according to Russell (1979) they do not belong to the clinically important pitvipers of the New World. Although these snakes must be regarded as potentially dangerous on account of their size, and may be capable of causing fatalities in humans, they are probably not of any public health significance.

Since 1947, the senior name *pulcher* Peters, 1862 has been correctly used at least four times as the valid name for the eastern (Amazonian) species; it has the junior subjective synonyms *albocarinatus* Shreve, 1934 and *alticolus* Parker, 1934. The western species has the valid specific name *campbelli* Freire, 1991, of which *almawebi* Schätti & Kramer, 1993 is a junior subjective synonym.

In conclusion, no action by the International Commission on Zoological Nomenclature is required in this case.

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